Lake Michigan Potential Damages Study

Planning & Zoning Center, Inc. and Wade Trim

Prediction of Responses to Hazards Related to Lake Level Changes

Task 3.3.1
Focus Groups of Riparian Stakeholders

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Task 3.3 Estimate Future Costs for Structural Protection
The influence of changes in water levels as a result of alternate hydrologic scenarios or modifications to the regulation procedures must be assessed in terms of alternate or avoided costs of structural protection. Baird and Associates developed preliminary estimates of avoided costs for structural protection as part of the 1992 International Joint Commission (IJC) Levels Reference Study. This work relates to work undertaken under Task 6.7.

The purpose of the focus groups is to assess the response of riparians to both an increase and a decrease in the frequency and magnitude of high lake levels (i.e. there may be more or less pressure for implementation of shore protection). Focus group findings will be used to help assess the costs of higher or lower design crest elevations on the per meter cost to implement shore protection; and, assess the effectiveness of likely riparian responses and the consequences thereof (some shore protection will reduce damages, while other types of shore protection may not reduce damages at all or even aggravate damages downdrift; hence, a decrease in erosion losses may not result from an increase in structural protection).

FOCUS GROUP METHODOLOGY:

Two focus groups were conducted to identify the responses of shoreline property owners and local officials to potential damages from changing Lake Michigan levels.

A focus groups is an instrument to obtain information about the choices people may make and the reasons for those choices when faced with a particular situation. A focus group is different than a survey instrument in that the questions are open-ended. Participants are permitted, encouraged, to answer in their own words.

A mailing list was developed with help from organizations involved in local and state-wide decision making (Wisconsin Sea Grant, Michigan Department of Environmental Quality, Macatawa Area Coordinating Council, Manitowac County Parks and Planning Department and the City of Two Rivers). People in the following categories were invited to participate in the focus groups:

- Lakeshore residents. This includes the owners of single family cottages, year-round residents and condominium residents of properties directly fronting on Lake Michigan.

- Lakeshore nonresidential. This category includes the owners of commercial and industrial businesses or managers of utilities with facilities directly fronting on Lake Michigan. It also includes the owners of resorts, restaurants, other shops, and industrial businesses.
- River/harbor residents. This includes the owners of single family cottages, year-round residents and condominium residents of properties directly fronting on rivers and lakes connected to Lake Michigan. These properties are on river segments or inland lakes close enough to lake Michigan to be effected by changes in Great Lakes levels, not upstream of any upper dams on the rivers.
- River/harbor nonresidential. This category includes the owners of commercial and industrial businesses or managers of utilities with facilities directly fronting on rivers and lakes connected to Lake Michigan. It also includes the owners of resorts, restaurants, other shops, and industrial businesses. These properties are on river segments or inland lakes close enough to Lake Michigan to be effected by changes in Great Lakes levels, not upstream of any upper dams on the rivers.
- Local government officials. This category includes elected or appointed officials of townships, villages, cities and counties of communities that front on Lake Michigan or rivers and inland lakes directly connected to Lake Michigan. These officials are involved in planning and zoning decisions, capital improvements planning and the management of Lake Michigan or river/harbor properties the communities own.
- State government officials. This category includes officials of state agencies with a regulatory or permit review capacity or management responsibility of state-owned Lake Michigan or river/harbor properties.

Invitations were sent to approximately 100 persons.

Two focus groups were held, one each in Wisconsin and Michigan. The Michigan focus group was held at the Howard Miller Community Center in Zeeland, which is in Ottawa County, only about 6 miles from Lake Michigan. The Wisconsin focus group was held at Lakeshore Technical College, in the village of Cleveland, about 10 miles north of Sheboygan, in Manitowac County. The village is in Cleveland Township, a shoreline community. In addition, a test of the focus group model was held in Lansing, Michigan, with Lake Michigan property owners invited who had primary residences in Lansing. Fourteen persons participated in the Michigan focus group, fourteen in Wisconsin and five in the test session.

Following introductions, there was a discussion of the purpose of the focus group and how it would be conducted. The major content of the discussion was prompted by a series of questions. Participants brainstormed answers to the questions. They then watched a short, projected, MSPowerpoint slide presentation about how and why Lake Michigan levels change and the historic extent of that change, the effects of that change and a prediction of potential change scenarios over the next 50 years. (See Appendix A) The same questions

as asked before the educational session were repeated to look for changes in participant responses.

Brainstorming comments were written on a flip chart so all participants could see what was recorded. These notes are included in Appendix B. In addition, the sessions were video-taped so that the consultant team could verify comments when analyzing the results. Participants all signed a video release form to permit the video taping. Participants were told that the tapes would not be released nor would specific comments be attributed to any individual.

Following the discussion session, participants were asked to fill out a five-page survey that addressed the physical conditions of their property (if they owned shoreline property), and questions about how rapidly they would respond to a hazard and at what level of damage and investment they would respond. The survey also asked what types of actions they would take, such as constructing shore protection, lobbying for governmental action, selling their property or others. The survey asked for a response about their own properties and about how they believed other property owners might act. Twenty-six surveys were returned. The survey and results are in the Appendix C.

These results are very tentative since the number of persons involved is very low. We would expect slightly different circumstances if a large number of focus groups were conducted. We recommend more focus groups be conducted along with targeted interviews and dissemination of a carefully conducted survey.

FOCUS GROUP FINDINGS: SUMMARY OF RESPONSES

Observations

The following discussion summarizes observations made by participants, as prompted by questions posed by the facilitator. The purpose of this summary is to identify the full range of participant observations, the relative balance of those observations and to describe how participants think. A discussion of consensus points follows. A list of individual responses is in Appendix B.

1. There was a wide range of responses among participants as to what they will do or what should be done if Lake Michigan levels reach projected highs and lows within the next 50 years. Participants suggested actions ranging from armoring the entire shoreline to abandoning the entire shore and moving people away, to artificially controlling/regulating the level of Lake Michigan. The term, "control" regarding lake levels seemed to be favored, although many knew that Lake Superior was "regulated."
2. There was an undertone, sometimes fairly obvious, that many participants were looking for a simple answer to protecting shoreline properties from future damages. They recognized that the situation was complex, involving natural processes and government regulations, but their need was simple: they wanted to avoid damage to their property so they could continue living by the water. There was frustration that initial shoreline protection efforts didn't

work. For some this was due to a failure of those giving property owners advice to give accurate information or for agencies to permit them to do the job right the first time. A small portion of participants cited control of Lakes Michigan and Huron water levels as a feasible, future option. Some of the other participants had not heard of this and initially embraced the idea, but their support depended on additional information. Another, small portion of the participants expressed disbelief that lake level control was feasible. For those who believed in the concept, they took references to the word, "feasible" as meaning "doable," while it appeared those using the word, "feasible" were discussing costs rather than capability.

3. Most believed that some human action on the shoreline of their property could buy them enough time to enjoy their investment. However, the longer the respondents had owned their property, the less inclined they were to fight natural forces. Oddly, the focus of their investment seemed different between Wisconsin and Michigan.
    - Wisconsin property owners worried about the loss of land. Most of them built their houses farther back. There is a state-wide 75' mandatory setback and depending on the county, a local setback of 2.5 times the bluff height for bluffs over 10' high.
    - Michigan property owners worried most about the loss of homes and cottages.
4. There was a sense of inevitability that shoreline will be lost, either land or houses, in both states among participants with a longer ownership. The following continuum illustrates this point and the associated attitudes:

Attitudes of Property Owners Related to Length of Ownership

New Property Owners	Multi-Decade or Multi-Generation Owners
• Water can't/won't do any more damage. • What can be done to prevent damage/loss?	• Live with it – “enjoy while you can.” • Wisconsin: “shoreline property owners should use common sense.” • Michigan: “buyer-beware.” • Keep it until you lose it.

5. Knowledge of shoreline issues (erosion, shore protection, lake level change and government permitting authority) is very high among riparians and local officials. Virtually all property owners were aware that there were existing state or local regulations and permit programs that dealt with what they could do to protect their shorelines from damage.
6. There are people with shoreline interests that exhibit risky behavior. It was clear that these were primarily other people who did not attend the focus group session. Often they were “new shoreline property owners.” Participants tied this risky behavior to both ignorance and a disbelieving attitude. Many

admitted failure of their own previous attempts, but described these attempts at shore protection as good intentioned, and taking place prior to their having adequate knowledge. Examples offered by participants include:

- Private residential property owners who, in low water built accessory structures near the water's edge and then suffered a loss during high water or winters.
- Marinas that built docks at which boats were damaged both at high and low water. At high water, boat hulls rode over the dock edges and pilings and at low water, waves drove boat decks up against the undersides of docks.

7. Participants were frustrated with regulators at all levels of government. These frustrations were due to:
   - Lack of consistency between agencies and between staff at an individual agency. There appears to have been a change in official attitude over appropriate shore protection approaches over time. Information from the state may not be the same as from the federal government or local government. Property owners tell of being denied permission to use a particular approach while another participant in the same focus group was told they could only use that same approach. Participants (in Wisconsin) were visibly shocked when discovering the perceived disparity. "They let you do what?"
   - Lack of options. Property owners report being given a "take-it-or-leave-it" approach to granting of permits for shore protection structures. A state agency might provide educational materials that described a series of options to a property owner but only permit them use of one or none of the options without any explanation why.
8. The loss of land due to Lake Michigan shoreline erosion was high on both sides. Personal accounts related losses on individual properties of over 100' in Michigan and 400' in Wisconsin. Generally, the actual experience of shoreline loss by participants was substantially less.
9. Property owners on both sides of the lake have experienced the erosion consequences of shore protection on adjacent properties. They have either been the adjacent property victim, had the erosion cut behind their own protective structure or had witnessed the effects on nearby properties.
10. Most, but not all participants correlated Lake Michigan shoreline damage with high lake levels combined with storms as the source of land and property loss. A few were aware, before the educational session and mostly through their own experience, that water in the bluffs contributed to bluff slumping. A few asked if bluff slumping would continue even if the Lake Michigan level is controlled/regulated so that wave erosion no longer takes place.
11. While much of the Wisconsin shore zone is undeveloped compared to Michigan, Wisconsin participants predict the eventual residential strip development of their entire shore, and we interpret this to mean within the 50 year planning horizon.
12. There is considerable public investment at risk along the Lake shoreline and estuaries in Wisconsin: roads, power plants, water treatment facilities and

marinas. There is in Michigan as well, but it this was not raised by Michigan participants. Some of this investment is seen as encroachment -- building out into the water, especially marinas. One attitude is that this is a waste of taxpayer money.

13. A small group of participants believed that one prolonged low-water effect would be a "lowering-of-the-guard" against high water hazards. People would not use "common sense." Again, respondents expressed the belief that the most likely property owners to subsequently build in hazard areas are the inexperienced, ignorant and defiant. There was a cynicism that local governments would stop them (i.e. they believed they would NOT be stopped).
14. There is no collective voice for the government (federal) to take action or provide financial assistance for large-scale structural protection of the shoreline. This did not reflect a widespread sense that the federal government does not care (although this was mentioned by one or two), but that this would not be a good use of taxpayer money. This reflects the results of other focus group studies conducted in Michigan and other states in unrelated projects -- it is important that the government use taxpayer money wisely.
15. A few participants in both states blame the dumping of "excess" Lake Superior water for high water on Lake Michigan plus Lake Huron. A nearly equal number of participants expressed disbelief that this could affect Lakes Huron and Michigan to any measurable degree.
16. Inland flooding effects of Lake Michigan are poorly understood, associated more with snowmelt and rainfall on the upland portions of the estuarine watersheds than with high Great Lakes levels and storm surge.
17. Most believe low water is a minor inconvenience for estuaries and not a problem for Lake Michigan shorelines. Participant observations focused on recreational boat grounding and limitations for commercial shipping. However, there was only one river/harbor property owner participating in the focus groups, and this was in Wisconsin.
18. The responses were highly varied to questions about how much damage it would take for property owners to act, what they would spend to protect their properties and how quickly they would act to a perceived or real hazard. However, there were trends:
    - Property owners responded, and participants estimated the response of others that there would be a fairly rapid response to damage. There were some estimates that action would occur upon learning of the potential for damage. However, most believed that action would take place when damage is imminent or when damage has recently occurred (1 to 2 years following damage).
    - The amount of potential damage that would trigger property owner action was a wide range, from just over $1,000 to greater than $100,000 (a few of the participants managed extensive public facilities in which property damage could reach several million dollars). Most of the responses suggested that shoreline owners would respond if damages were in the vicinity of $10,000 to $15,000.

- Most property owners would spend about 25% of the value of their property in protecting it. The range extended from spending nothing (a few chose this response) to 100% of the value of the property (a few chose this also). For discussion purposes, a percentage was used instead of a dollar amount. This is because costs can change over time and approved methods of shoreline protection may change over time. Spending could be on shoreline protection or it could apply to moving domestic structures.

19. For a portion of participants, the scenario in which high water could damage or destroy public infrastructure was a "wake-up." Only a few called for a change in public policy regarding infrastructure. A few others thought this was a serious problem, but this eventuality appeared to be too complex for this segment to generate a coherent response. About half the participants had no reaction to this aspect of the scenario.
20. No one picked up on the possibility (expressed in the (IJC 1993 Lake Levels study) that controlled/regulated Lake Michigan levels could lessen the threat of inland flooding of estuaries -- and therefore, require delineation of new floodplain elevations. But several observed that projected high levels would require new delineation of floodplain elevations.

CONCLUSIONS

The IJC lake level study, published in 1993, included results of a survey of riparians. Instead of a survey, focus groups were conducted as a "survey" instrument in 1999. The earlier study looked at the frequency of use of shoreline structural protection, at choice of protection options and at the frequency of use of technical assistance. While a survey could be used to ask property owners about what they envisioned doing in the future regarding shoreline protection, the focus group approach looks at a variety of issues related to shore protection, and permits the participants to generate their own list of viable options and future approaches.

A focus group is different than a survey in that the number of respondents is quite low and therefore, predictions of the number of persons choosing a particular action are not as reliable. There can be some bias introduced simply by who, among those invited, chooses to attend. However, there are qualitative responses that provide insight into the study population. Also, it is possible to determine whether there is consensus on an issue, or whether there is a diverse thinking within the target group.

The more important results of a focus group are that it identifies what is on the mind of the study population and how they express themselves on the topic. There is an advantage to this approach compared to a survey because the latter instrument could ask as series of questions that misses important concerns of the study group and doesn't use terminology that they recognize. While both types of instruments seek information that is important to the person or agency

asking the questions, a focus group is better at obtaining answers from the point of view of the respondent.

If the participants at the focus groups were representative of broader shoreline property owners, the focus group results suggest that there is consensus on a number of lake level-related issues and a wide range of positions on a number of others. The remainder of the discussion identifies where there is consensus, how we predict stakeholder groups would respond to high and low lake level scenarios (a decision tree) and where there are needs for more research.

Consensus

The following points of apparent agreement are gleaned from the dozens of comments by focus group participants. They are interpretations by the consultant team, and generally do not reflect specific language used by participants.

1. The motivation to be at the water's edge and to invest in it is high for all who can afford it. This motivation remains high even when faced with the risks of property damage and financial loss. Perhaps this is an obvious conclusion, but it is important in that it will likely affect decision making in the future. In the future there may be an increasing number of property owners who have held the property a long time. Longer ownership results in greater appreciation for the vagaries of Mother Nature and less inclination to fight her with shore protection.
2. Among shoreline property owners and local officials, the belief is that there is no clear, coordinated governmental effort to respond to development risks in the hazard zones. However, there is a clear understanding that states are constrained by funding shortages, local governments are generally afraid to respond and the federal government has no definitive policy.
3. The appropriate governmental roles (as expressed following a specific question to that effect) are:
    - Federal
        - Identify a practical solution for damage reduction
        - Implement the solution if possible.
        - Educate property owners and local officials.
    - State
        - Act consistently when dealing with property owners
        - Back up local governments with adopted regulations with teeth, but don't impose unfunded mandates.
        - Education of property owners and local officials.
    - Local
        - Zoning implementation, but deferral to state agencies will be common because locals don't want to be the "bad guy."
        - Encourage appropriate development.
4. The majority of shoreline property owners are willing to invest in protective measures at least once.

5. The majority of shoreline property owners believed some form of rip-rap of bluffs to be the approach most likely to work and to be approved in areas where bluff erosion takes place.
6. The majority of local officials believe deep setbacks of residential or commercial structures is the most appropriate response to erosion hazards. Only a few were aware of the option of moving structures back from the bluff.
7. Recognition of the link between high water levels and bluff erosion is strong among participants but the understanding of shore processes and the relationship of shore process to protection methods is low. A frequent comment was that the issue is complicated. There is fairly widespread recognition that the composition of the shore differs among shore segments and that this is a factor in property loss.
8. Participants believe that there are land use planning and zoning tools that could help limit structural damages if applied, but that they are rarely utilized effectively. Participants also have only a vague understanding of these tools and how they could be used.
9. In the shoreline setting, property rights are important but of necessity tempered slightly compared to non-hazard areas. This suggests that shoreline property owners are under a moral obligation to conform to regulation but that this does not extend to prohibiting building. There is no clear consensus of what to do about shoreline sites with extremely limited building opportunities. There was a widespread reluctance to discuss this latter situation.
10. There is a widespread awareness -- but very limited understanding -- that Lake Michigan and the estuaries are tied to valuable ecosystem resources, such as wetlands.

POTENTIAL DECISION TREE

The following discussion describes a “decision tree." It predicts “what next,” "when" and “why,” for the different “what if,” scenarios. This "decision tree" is outlined in the text and table, below.

Scenarios "What If"

Focus group participants were posed the questions: *"What would be your response to prolonged periods of high water levels?"* and *"What would be your response to prolonged periods of low water levels?"* Their responses were recorded and grouped according to category of participant, such as property owner, property manager or local official. While state officials of both states were invited, none from the regulatory community participated. A Wisconsin Department of Natural Resources State Park manager participated. Only one nonresidential private property owner attended and only one river/harbor residential owner. No river/harbor nonresidential private property owner participated.

The table below shows the responses of the different participant groups to the two scenarios. Where there appeared to be a significant difference between respondents of the two states, this is noted.

Information about "when" property owners would act was gleaned from the survey completed by focus group participants at the end of the session. Participants were asked to mark on a continuum, the point at which they or others would likely respond to a lake level-related hazard.

"What Next"
Prolonged high water scenario

Likely private property owner responses to high water:

- The most likely response will be to contract for shore protection. The written responses were more definitive on this issue than oral comments in the focus group. This is a near certainty for the owners of developed, shallow lots where recession rates are high. Shore protection may be the first thought for new property owners. It may be improved shore protection (more massive) for long-time owners whose previous approaches were insufficient to prevent bluff loss. Where a shoreline protection approach has been working, the choice may simply be to maintain it. Those who have owned property for many decades and who have deep lots will likely abandon shore protection efforts and move the principal structures back (see third bullet below).
- A secondary response will be to try to implement shoreline protection on a neighboring property (by convincing the owners or by purchasing the property) to protect the primary property from side-cutting.
- In bluff erosion areas where structures are threatened and lots are deep, cottages and houses will be moved. Undeveloped, eroding, but deep properties will likely be developed, but farther from the shoreline than initially planned. This is probably more the case in Wisconsin where there seems to be a greater knowledge about state-mandated setbacks. A very knowledgeable few may try to obtain variances for placing dwellings within road-side set-backs.
- Only a very few will try to sell their property, especially among those who have owned for a long time.

Likely public shoreline property manager responses to high water:

- Where feasible, contract for shore protection. The more intensive the capital investment, such as treatment or power plants, the more rapidly will be the action to protect.
- To the extent that administrative boards believe predictions of very high water, they will seek replacement structures out of hazard zones. There seems to be a lower chance of this than for additional shore protection of capital intensive facilities.

Likely local government responses:

- Lowered or phasing out of investment in capital intensive infrastructure (like roads, water treatment plants, sewers) in flood or erosion hazard areas.
- More likely to redevelop floodplains as parks.
- More likely to forego repairs to shoreline facilities.
- Local officials believed there should be a re-examination of the 100 year floodplain delineation in light of the potential high water scenario. The floodplain boundaries were recognized as a governmental role, state or federal, not a local role.
- Mention of the FEMA (federal) program drew little response. Local officials knew if they had participated but could not speak for the motivation of those who did not.
- Reduce property tax assessments on affected property.

Likely state government regulatory responses

- There was no direct involvement of state government officials in the focus groups so not enough information to form a conclusion.
- When asked about the state role, other participants feared continued low funding would restrict state involvement.
- If the views of other participants could be translated into legislative action, then the state role would be expanded to include tightened regulations, greater oversight and education of property owners.

Likely interactions. The following actions between the participant groups is likely given the responses provided at the focus groups:

- At least a portion of property owners will continue to seek relief from the federal government in the form of control of lake level extremes. The position of those who support this approach is unwavering.
- Local property owners will continue to seek permits for shore protection from the states. The number of those who apply may decline, but this depends on three factors:
    - How long they owned the property. Longer ownership suggests less inclination to construct shore protection devices, unless a home or cottage is endangered.
    - Whether the property is constrained by shallow depth in an area of rapid bluff recession. Where dwelling units cannot be moved due to a lack of space, there will be a greater inclination to construct shore protection.
    - Whether the states continue to permit shore protection structures. As evidence mounts that shore protection structures will eventually fail, and that they can interrupt natural shoreline processes, policies may change and shoreline owners may gradually learn of the change in policy.
- Major facilities, such as water treatment plants, seeking alternative locations for future rebuilding, which will require dealing with both state (permits) and local officials (planning commissions and building and other local departments).

Prolonged low water level scenario

Likely private property owner responses to low water:

- For most Lake Michigan shoreline owners, an end to panicking and blissful enjoyment of the wide beaches.
- For an undetermined proportion of estuarine and harbor owners, extend docks or apply for dredging permits. Participants from other categories suggest these property owners will try to move closer to the water. For some this would require building in violation of local permitting rules or asking for variances from communities to build in the floodplain.

Likely commercial shoreline property owner responses to low water:

- There is not any particular evidence that commercial property owners will respond differently than private, residential property owners but few participant responses were received in this category.

Likely public shoreline property manager responses to low water:

- Parks managers will need to deal with increased public use due to better beach access.
- Public marina managers will likely have to deal with recreational navigation limitations. Some marinas may have to rebuild docks to prevent damage to boat decks.
- Water treatment systems may require enhanced and more expensive treatment methods and longer intake pipes.
- There may be pressure to expand facilities of various public agencies (parks, public works) along the waterfront.

Likely local government responses to low waters:

- Raise property tax assessments
- Make capital improvement decisions that place greater investments in hazard areas.
- Local officials anticipate having a difficult time rejecting permit applications for people asking for variances. It was reported that many (but not all) local boards do not want to deny property owners the right to do with their property as they wish. It was also reported that in periods of low water, many zoning appeals board and planning commission members see little obvious reason to turn down requests for variances.
- Some will buy land and keep it public to prevent future building.

Likely state government regulatory responses to low waters:

- State agencies will face increased pressure to relax permit requirements.
- State agencies will likely suffer funding cuts when legislators perceive a reduced threat of destruction.

Likely interactions. The following actions between the participant groups is likely given the responses provided at the focus groups:

- All the actions to deal with damages from high water will diminish. This includes:
  - The drive for lake level control will find less support.
  - There will be fewer applications for structural shoreline protection.
- Permitting agencies at all levels will be faced with requests for variances from standing rules so property owners can build in high-water hazard areas.
- There will be increased requests by private interests and public facilities for dredging permits or projects.
- Funding for protection projects and relocating public facilities will find diminished support.

Decision Tree Table for Each Stakeholder Group.

What if	Who	What Next	When	Why
Prolonged High Lake Michigan Levels				
	Residential lakeshore property owners	Build shoreline protection structures.	As water levels rise -- when damage is imminent to within 2 years after damage	Reduce or eliminate loss of land or inhabitable structures.
	Estuarine residential property owners	Unclear	Not enough information	Not enough information
	Commercial lakeshore property owners	Probably the same as residential owners but unclear.	Not enough information	Not enough information
	Public facility managers	Build shoreline protection in short term. Build replacements on higher ground in long term.	As water levels rise. In replacement funding cycle.	Reduce or eliminate loss of function, contamination.

What if	Who	What Next	When	Why
	Local officials	A few will tighten zoning setback requirements and enforcement. (Wisconsin) Most will defer to state permit programs. (Michigan) Local public facility investment will decline in hazard zone.	When water levels rise and properties begin to experience damages.	To reduce overall damages and limit liability. To limit future financial losses.
	State regulatory officials	Not enough information	Not enough information	Not enough information
Prolonged low Lake Michigan levels				
	Residential lakeshore property owners	Enjoy the wider beaches Save money toward future shore protection construction when water levels rise again	As soon as beach widens.	Longitudinal beach access opens once lake level lowers. Knowledgeable property owners know low level only temporary.
	Estuarine residential property owners	Unclear	Not enough information	Not enough information

What if	Who	What Next	When	Why
	Commercial lakeshore property owners	Probably the same as residential owners but unclear.	Not enough information	Not enough information
	Public facility managers	Public marinas may have to dredge. Water treatment facilities may have to adjust treatment methods for Lake Michigan water (altered characteristics at low water).	At more extreme low water.	Some boat slips may be unusable and some boaters running aground. Water at low lake levels is warmer and contains more contaminates.
	Local officials	Deal with property owners who want to build in areas that are hazardous at high water.	Within one or two years of start of low water.	Property owners no longer feel threatened and want to build close to the water.
	State regulatory officials	Not enough information	Not enough information	Not enough information

EFFECT OF THE EDUCATIONAL COMPONENT OF THE FOCUS GROUPS

The focus groups were fashioned to ask two basic questions both before and after a short educational presentation. *"What would be your response to prolonged periods of high water levels?"* and *"What would be your response to prolonged periods of low water levels?"* It was assumed that some, if not all, participants would not be well versed in lake level issues before the session. The educational segment presented information and illustrations on why lake levels change, the degree of historic and projected fluctuation, the impacts of the change. The following are observations of the facilitators on the effects of the educational segment:

- The participants were much better informed before the focus group than expected. In the pre-educational segment brainstorming, participants listed many of the points presented in the educational segment.
- Most did not have a clear understanding of the potential degree of level change. An illustration made a great deal of difference. Participants did not seem able to comprehend potential lake levels on the basis of a number alone.
- It hardened the extreme views. Lake level control advocates commented that the illustrations proved their point. Another small group believed it showed how risky and unacceptable was development in the hazard zones.
- It raised many questions. While most seemed to understand the effects shoreline process have on specific parcels, they wondered about the big picture. *"If the shoreline is receding, is the lake getting bigger? Where does the sand eroded from the shore go?"*
- Participants generally appreciated having the educational segment available. It helped them comprehend shoreline processes. Many participants showed particular interest during the presentation, often nodding in agreement to a particular point.

AREAS FOR FUTURE RESEARCH

Unanswered Questions

There is a gap between the issues raised by various agencies and interest groups and the participant responses. Answering the following questions would make dealing with shoreline hazard issues easier:

1. Are there more effective planning and zoning tools for local government to deal with hazard areas and how do they implement them?
2. What links can be made with values held by uneducated, inexperienced or new waterfront property owners for educational materials on hazards related to changing lake levels? This group seems intransigent about shoreline hazards and exhibit behaviors that risk their property and that of others.
3. What will be the effect of global warming on Lake Michigan level cycles in our lifetime? Participants reported hearing conflicting predictions.
4. What are the environmental consequences or benefits of:
    - Changing Great Lakes levels
    - Shore protection
    - Lake level control?
5. Who is the most trusted source to bring information to the public?

Methods

As the Potential Damages Study extends to other portions of the Lake Michigan shoreline, the focus groups should be continued with the following modifications:

- The educational materials should by tailored for each state. Wisconsin participants said that the illustrations were of the Michigan shore -- not Wisconsin.
- Focus groups should be continued in an effort to reach the following groups that did not respond to the invitations:
  - Nonresidential waterfront owners
  - State regulators and perhaps, legislators
  - Persons who have owned shoreline property for a relatively short time.
  - River/harbor residential and nonresidential private property owners.
- Future focus groups should be set up with greater certainty of obtaining participants. This could be insured by having a greater number of focus groups that target particular stakeholder groups. The focus groups could be arranged through those groups with greater assurance of obtaining participants. The greatest challenge will be to get participation from those who see no problem, such as first time property owners who have yet to experience high water or damages, or by those who believe in a single solution (such as regulating lake levels).

There is a place for focus group reaction to the updated bluff recession line, shoreline protection inventory and parcel mapping. These were expected to be available for focus groups in this pilot project but were not. However, we did obtain helpful information from private property owners whose focus was on individual properties. We need reactions to illustrations that show the magnitude of potential damage to better gauge the reaction to a sense of loss to the whole community. There were latent expressions of an attitude of looking out for the good of the group, but the degree of this was hard to measure. Such attitudes will have expression in local decision making and lobbying for legislative changes.

It is important for future research and discussion on likely responses to Great Lakes level changes (and related issues) to be framed in concepts, values and vocabulary understood by the research subjects and not by the groups conducting the research. For example, many participants used the term, "control" of lake levels while agencies use the term, "regulate." The latter term may reflect the legal status of the international agreement involved, it implies a bureaucratic activity, not a physical result in the lives of lakeshore property owners. Future research instruments and educational sessions and materials should reflect that difference. There is a stratification of understanding of lake processes shown in the table below:

Level of Understanding	**Stakeholder Group/Agency**
Highest understanding with lake issues and processes	Army Corps of Engineers, state DNR, DEQ, Sea Grant, Universities, local and county officials where government activity is highly involved and participatory
Moderate understanding	Long time property owners, some local officials and environmental organizations
Low understanding	More recent property owners, county officials in general, realtors
Almost no understanding	Some county and local officials, new shoreline property owners, future property owners

RELATIONSHIP OF FOCUS GROUPS TO 1993 RIPARIAN SURVEY

As part of the 1993 IJC Lake Levels Study, a survey of riparians was conducted dealing with shoreline protection approaches and technical assistance. While only a summary of the 1993 Survey was provided to this consultant, rather than the full questionnaire and tables of results, a few comparisons can be made. These are:

- While in 1993, shoreline property owners were thinking in terms of what shoreline protection structures they should choose, in 1999 riparians considered only a few options as viable. In part this was due to a perceived (or real) change in permit regulations, limiting choice to as little as one approved method. In part this was also due to an apparent increased consideration of doing nothing to the shoreline. In this latter choice, riparians would either live with the loss of land or, where necessary and possible, move their residential structures.
- At least one focus group participant did know about or have experience with a different structural protection approach than that used on or near their property. Most participants in 1999 identified rip-rap in some form as the most likely, approved structural approach. They also were aware of breakwaters and beach nourishment, but were wary of approaches that required multiple property owners to cooperate.
- In the 1993 survey about 50% of respondents received no technical assistance and of the other half, most received technical assistance from private contractors. It appeared from focus group comments that nearly all of the 1999 riparian participants had received some form of technical assistance from a governmental agency. The assistance may have been as simple as interaction by phone. There is a self-

selection process in a focus group, so persons not responding to the invitation may be reluctant to interact on the subject and could be a group of indeterminate size that has not attempted interaction with government agencies on shore issues.

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APPENDIX A
Focus Group Presentation

Insert MSPowerpoint presentation here

APPENDIX B
Focus Group: Michigan
Zeeland, Michigan, September 16, 1999

Number of participants: 14
- Lakeshore property owners: 2
- Local officials: 10
- Property Managers: 2

Number of facilitators/consultant staff: 2

Participant Observations

Brainstorming on Effects of High Lake Levels

- Lakeshore destruction
- Homes falling in
- Dune erosion
- Loss of public and private beaches
- Inland lake development that wouldn't occur with low water
- Property value loss
- Vegetation destabilized along shore siltation/erosion.
- Loss of wetlands and marshes
- Flooding in some areas; on road in Saugatuck
- Increased shore protection structure
- Increased damage rate in storms
- Lots of work for shore construction contractors
- Impact on municipal infrastructure
- Sewer outflow piping affected
- Farm field flooding; drains couldn't discharge
- Water in basements
- Record highs and near high erosion
- Increased shipping profits
- Increased hydro power from high rainfall
- Change in nutrient levels
- Decreased dredging
- Increased boating

Brainstorming on Effects of Low Lake Water Levels

- Development encroachment on now dry land.
- Stricter waste discharge limits
- Good for tourism
- Uncovers past shore protection projects
- Increased shipping costs
- Waterfowl die-off
- Increased dredging
- Bottom sediment stirred up from boat traffic
- Municipal water intakes exposed

- Municipal water intakes quality changes (top/warm water)
- Concern over supply vs. diversion
- Affects boating or perception
- Less freighter cargo
- Boating activity restricted
- Wildlife impacts
- Changes ecosystem
- What is definition of prolonged?
  - 2-3 yrs
  - 10-12 yrs effects wildlife
  - tree stumps suggest 15 yrs +
- Some impacts occur from shorter prolonged periods, some from longer.
- Rise and fall is natural
  - Not universally accepted; there are man-made effects
  - Lake Superior Regulation Plan

What will you/community do in response to high water?

- Public official -- Communities will replace public infrastructure; roads, sewer, water
- Some will have to move their houses back from eroding bluffs or out of floodplains
- Communities will have to change where building is permitted (zoning)
- Communities should mitigate and manage for middle not extremes of lake level effects
- Prevent unsustainable development that requires extensive maintenance when level changes again
- High water will trigger increased interest in lake level management

What will you/community do in response to low water?

- Develop a strategy for regulation to prevent building on dry floodplains
- This issue will affect a small number of residences, but only if the low water is really prolonged; mostly marinas will be affected
- Does the 100-year floodplain level change?
- Exposed public facilities -- local water and sewer authorities will have to deal with water intakes and discharges that don't function properly

After the educational segment:

What will you/community do in response to high water?

- It may be important to maintain high water levels on tributaries through structures, which will require special assessments
- There will be a need for increased education to avoid creating problems the next time there is high water. This will need to reach state and local planning commissions more than just elected officials.
  - It will be important to increase public support for building restrictions, not just provide new legislation.
- Develop programs to remove structures from hazardous areas

  - Current policy doesn't encourage it.
  - It may be difficult to accomplish because this would reduce the tax base.
  - Conservancies do this when properties become available following damage
- Relieve Niagara River constipation (relatively low cost) to allow more water to flow out of system
- Change Lake Superior Regulation Plan to stop dumping
  - This would be proactive
  - Contrary to presentation, differences in expert opinion is not if it is doable; just how and how much it costs.
  - Especially given predicted ranges like seat belts in cars.
  - Ecosystem effects of stable lake level should be examined
  - The 1992 Lake levels study said stable lake levels are bad based on wetlands as a measure. Is this true or can they survive shorter range?
- Local master plans should make provisions to change building patterns to limit damage in hazard areas
- Give serious consideration for revising 100 yr. floodplain elevations (also-global climate change) because it will be higher.
- Predicts that other property owners will panic and they will either build shore protection structures or sell their properties.

<u>What will you/community do in response to low water?</u>

- Won't do as much, perhaps nothing, because there is less panic with low lake levels than high
- There is concern over limitations to recreational boating
- Some property owners of floodplain sites will move into the areas that now appear to be dry
- There will need to be strong enforcement of floodplain and setback regulations
- To be successful in enforcement, communities may need to justify building restrictions on historic data
- Floodplains tend to lose clear wetland identity, and this makes enforcement more difficult -- property owners no longer see a problem with development
- There is a need to re-examine or adjust for low water effects at the zone where water from the watershed mixes with Lake Michigan water. There may not be enough water to avoid environmental and aesthetic problems
- Nutrients in lakes cause problems such as fish die off
- Farmers will begin to farm again in the marshes

What do you think the governments' role in this should be?

- Federal government should expand research to get the facts and educate people
- It is uncertain what the federal government will do because property values are of less interest to the feds than ecosystem or farming issues
- State will continue mitigation efforts but this depends on permit applications
- The State should have more research money
- Local governments should push for state legislation to back up local zoning
- Joint state and other level efforts -- the state has experience and shows they have an interest

- Capture wasted energy of high water for hydro power
- Local units have left it up to states and this will go on until they are forced to act within their jurisdictions
- Regional groups should initiate research and educate; don't leave it up to the individual, local units
  - People have more trust in local units of government but local officials have mistrust of each other (jurisdictions)
  - There is considerably more awareness of issues at the local level
  - Local units are not yet changing how they do things (are not working effectively on a regional basis), but they do identify where they can get together
- Local units can't enforce strong regulation on lakeshore without state backbone
- Some property owners are better bankrolled than the communities and this causes the communities to avoid regulation or enforcement
- Saugatuck Township one of the few to match state rules until state became too complicated.
- The federal government need to resolve the takings issue before local units will act effectively
- And then there is CANADA -- a major "black box".

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APPENDIX B Continued
Focus Group: Wisconsin

Cleveland, Wisconsin, September 21, 1999

Number of participants: 14
Lakeshore property owners: 10
Local officials: 3
Property Managers: 1
Number of facilitators/consultant staff: 1

Participant Observations

Brainstorming on effects of high lake levels

- What is likely period of high levels -- what is the cycle?
  - One year +
  - Cycle uncertain
  - Seven years up, seven years down
- I've seen twenty foot shoreline loss + trees
- We put in 140' rock for shore protection
- Biodiversity loss
  - Half Moon Bay; high water takes out flowers, shrubs
- Waves hit coal dock at Wisconsin Power and Electric
- Property flooding in Milwaukee but only when there are onshore winds
- We lost up to 100' in three days
- My property has suffered four hundred feet of loss since 1967
  - Have 400' in frontage but could only afford to protect 200' in seawall
- Houses lost
- Ozaukee County land lost due to saturated bluff; 1996.
  - Water levels already dropped following heavy rains
  - Groundwater
  - Raise marina pier
  - Up to 55 linear feet inland
  - Virtually whole county rip-rapped

Brainstorming on effects of low lake levels

- Great beaches
- Brings out four wheelers
- Port Washington built new harbor-docks that were too high for small boats
- Manitawac harbor dredging
- A lot of natural beach healing and re-vegetation
- Re-establishment of protecting sand bars
- Difficult to get permits during low water but permits are slow to get during desperate times
- Can't stop Lake Michigan
- Shipping; boating; hydro-electric
- Loss of stream outlets

  - Habitat problem
  - Some will naturally flush out an opening
- Navigation problems (Green Bay especially)
- Need both high and low water for wildlife habitat; especially estuarine floodplains
- How much can humans effect lake level?
- How much should they?
- Should we allow people to rip-rap?

What will you/community do in response to high water?

- Apply for permit for shared shoreline protection protects.
- Adjust from individual to shared protection.
- There is a continuous residential strip developing along the shore and they will want protection.
- Development pressure is happening without common sense. New people want to develop any floodplain or cliff.
- Communities advise a deep setback, minimum 75' requirement but this is inadequate. Measurement is from toe of bluff, not top.
- A standard setback is easier to explain to people.

What will you/community do in response to low water?

- More will build in hazard areas.
- More beach activity.
- Power plants will have no need to respond to hazards
  - Won't dredge due to environmental constraints
  - Low water is a very low problem for intake plumbing
  - But it there are increased costs to deal with low water.
- Difficult to use high water mark for setbacks because of regulatory establishment.
- Local govts. need to establish more strict setbacks for lakes and rivers.
- There seems to be less pressure to alter nature but people still will try to build closer to the water.
- Communities lose zoning arguments, such as trying to prohibit massive fills to raise houses for views on many properties where at-grade houses can't see water.
- There has been a lot of litigation: Milwaukee County in the 1980's
- Lake Michigan should be treated the same as with Federal coastal regulations; no more subsidies.
- There has been increased building by municipalities into lake. It's an encroachment.

After the educational segment:

What will you/community do in response to high water?

- We will try to act now, to be ready in time for next high water.
- Most will have no different action next time as during last high water.
- Move the residential structures back from the edge.
- In some areas we should use breakwaters; but these are major investments in protection

- The Wisconsin power company plans to close a power plant; There is a 1400 MW plant at risk. With those high water predictions, more of them are at risk.
- It seems the damages get worse each time we have high water because there are more people and developed properties.
- It seems there's some potential to ship water out of the Great Lakes to lower the levels, as has been proposed in the past.

What will you/community do in response to low water?

- How likely are lows?
- With the predictions of global warming, will it dry or isn't it more likely to be warm and wet.
- We can't be sure, but if we may already be started with global warming: Ozaukee and Milwaukee Counties had back to back 6" rains, 100 year rains.
- I anticipate wider swings in lake levels.
- We should build more carefully.
- People will lobby for legislation to avoid the hazard areas.
- Increase educational efforts for property owners; existing laws, potential damages.
- There need to be state laws to back up education.
- It is hard to fight user throw away society.
- We need more research on protecting properties from bluff slumps.

What do you think the governments' role in this should be?

- Need a greater local government involvement. The local government role has been disappointing. They will not do anything if not required.
- There is no state support for local action.
- The state agencies are understaffed, and have a high turnover.
- We will need to fight efforts to be more permissive in shoreline development regulations. In the legislature, there have been proposals to weaken septic regulations, but these were stalled.
- Intergovernmental relationship needs to improve -- county level especially.
- Intergovernmental cooperation is happening in some areas. Cleveland Village and Township are cooperating on joint planning but there is no particular shoreline component.
- The federal government should pull out money for inappropriate development.
- There should be no subsidized insurance for hazard areas.
- Much more state and Federal research and education.

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APPENDIX B Continued
Focus Group: Pretest
Lansing, Michigan, September 7, 1999

Number of participants: 5
Lakeshore property owners: 5
Number of facilitators/consultant staff: 2

Participant Observations

Brainstorming on Effects of High Lake Levels

- erosion: loss of property
- reduction on use possibilities (swimming)
- debris, changing quality of water
- use of beach-if high water no beach -- restricted beach use
- pulling boats ashore difficult
- sand trap fences (2) and jetties (3)- cost high -all gone in a year
- restrictions on what can use for shore protection so now have rocks on bluff
- sometimes 50' or more loss in one year
- vegetative cover lost from sand when recedes
- high cost of replanting
- have to build and re-build stairs
- older folks can't walk to the beach

Low Lake Michigan Levels

- more beach, more walkers
- taxes go up
- enhances what you can do for a variety of age groups
- more buffer between waves and property
- high variability in value of property depending on lake level
- zoning too lax; cottages built too close

<u>What will you do in response to high water?</u>

- Not sure because in 1991, the DNR went over options and a seawall was the only thing they would approve, then in literature DNR provided it said that seawalls were bad
- I would try to protect the land and house
- Mine property is not in jeopardy, so I won't act
- There is no option to move back because the lot is not very deep
- Jetties were installed along our beach and it cut out and eroded the property next door. Unless all property owners do same thing, we can't protect the shore
- The only feasible option is more jetties and sandtraps or to haul in rocks. However, these are ugly and make it hard to walk the beach
- Our best option is to move the house back
- We used to lose a lot of sand by the wind in the winter

  - A concrete wall holds the sand in but the bluff is not very high
  - The wall works now with a beach but not in periods of high water
- At our church camp/colony, they imported huge stone (3-4,000# each) from Wisconsin. It is a 12' wide stone wall. The cottages are at lake level, with a buffer of 100' of trees. It has held well with maintenance.
- In our area of Manistee County, artesian wells cut up beach naturally, depending on sand shifts.

What action you take if several years of low water

- If would be a good time to sell as property values are higher than with high water
- Most people don't do much shore protection at all
- If I could I would buy a place
- We plant beach grass and trees to cover eroded areas

After the educational segment:

What will you/community do in response to high water?

- My brother would move the cottage back again. The property is 450' deep and it is not winterized
- Our area is so remote, property owners wouldn't do much or anything. They didn't do jetties when it was suggested.
- In our area there are 500'-600' frontage segments with unbuilt lots
- After the high water in the 80s they decided to do nothing
- My house is 200-300 yds. Back so I am safe for many decades
- In our church colony our cottage is 60 yds back from top of block wall so we don't expect to be faced with any problems
- My brother (who owns it now) is glad our family moved the structure back. It would have been damaged or lost.
- I not only built the cottage way back from the water, I got variance to build with only 30' road-side yard set-back.
- In Silver Lake, our family cottage is 50' from road and 70' to water
  - We will probably do more rocks and possible fencing (sand traps) to protect the cottage
  - The neighbors have the same sized lots
  - There are a lot of elderly property owners, and they may not be able to do much or they will try to sell.
  - If shore protection didn't work to save shore land, in couple of years, my family would probably pass the property along to me and my brother to deal with it.
- At the church colony we spent a lot on a big lodge so we would make a fantastic effort to preserve it
  - If the stone block wall failed, they could move cottages back toward the road
  - We are real committed to the place and will spend money to keep it
- In most places they are very expensive homes on the shore
- It is hard to consider selling
- We will probably will let it become all water before selling

- In some areas (Silver Lake, where distance between cottages and lakeshore is shrinking) there are a number of properties for sale for years. They just have not sold.

What will you/community do in response to low water?

- There are concerns on part of boaters that the discussions on lake level regulation are being politically motivated. It seems likely that boaters will raise levels back up
- By contrast to political clout of boaters, I think cottage owners are not a big strong group.
- Even though shippers have problems with low water, in Chicago in high water shipping has problems with bridges etc.
- We'll stay to bitter end of bluff recession. Why sell if it's no longer worth much?
- During high water periods we used to subscribe to ACE lake level report
- We were shocked in ’86 with loss from erosion
- We now know nothing is really safe
- Stormy seasons are not the only problem. In mild winters we don’t get ice to protect the beach
- It seems that wind and wave levels are higher in winter than the summer.

What do you think the governments' role in this should be?

- It is an excellent question. I'm not sure if lake level problems are the fault of ACE or they are the great benefactors -- more projects to do.
- The literature on shore protection from the DEQ is conflicting. That should be fixed -- consistent.
- The government's primary role should be to educate public and prospective property owners.
- It is not necessary to try to spend a lot of money on regulating lake levels.
- I lean more in the direction of buyer beware where there are hazards
- I doubt the general public shares that attitude.
- People typically look elsewhere, not themselves or mother nature for blame or to have someone bail them out of difficulty.
- I think it's good to have a uniform policy on dealing with shoreline hazards and damages.
- The governmental approaches should not be piecemeal, but consider the whole length of shoreline.
- It is a problem when policy winds shift.
- What about movability? There should be more emphasis on moving structures.
- There is a lure of living on the water no matter what the perils.
- People typically under estimate the power of the lake.
- If the lake level goes up, there is nothing you can do.
- Real estate disclosure forms are a start but the existing ones are not adequate.
  - Education is needed
  - Some disclosure is needed on deeds but property owners typically don’t see that until after closing.
- We looked early on, after purchasing shoreline property, for a lot of guidance from ACE.

APPENDIX C

FOCUS GROUP SURVEY RESULTS

The following five pages present the post-focus group survey each participant was asked to complete. The questions are shown here with the distribution of responses for each question.

The initials mean:
MT = Michigan Pre-test conducted in Lansing, Michigan, September 7, 1999
M = Michigan Focus Group conducted in Zeeland, Michigan, September 16, 1999
W = Wisconsin Focus Group conducted in Cleveland, Wisconsin, September 21, 1999
T = Total of responses for all three focus group sessions

DRAFT SURVEY RESULTS: Focus Group on the Effect of Lake Michigan Levels

Please take a moment to fill in the following, brief survey.
Your name (responses will be kept confidential)_____
Are you:
MT = 4, M = 2, W = 6, T = 12 a Lake Michigan or __W = 1_ connecting riverfront or lakefront private property owner,
M = 9, W = 2, T = 11 an appointed or elected official with no ownership interest in waterfront property,
W = 2, M = 1, T = 3 an appointed or elected official with a private ownership interest in waterfront property or
M = 2, W = 3, T = 5 a public official or staff person or an organization or agency that owns or manages a facility located directly on the water?

Organization or agency if you represent one
_____

If you own lakefront or riverfront property, in what township, village or city is it located? _____

How far is your home, business or facility from the water? MT = 40' - 300', M = 75' - 180', W = 75' - 450'.

How many lineal feet of shoreline do you own or are you responsible for? PRIVATE PARCELS: MT = 75' - 100', M = 50' - 600', W = 100' - 500', PUBLIC OR AGENCY OWNED: M = 1,000', W = 1,000s - 5.5 miles.

Between the house/business or facility and the water, is there (check those that apply and write in an amount for the size) a bluff MT = 10' - 50', M = 35' - 60', W = 10' - 53' (height ____), dunes _____ (height _____), low shoreline _____, wetland _____?

What shore protection structures have been constructed along your shoreline?
None _____,
Vegetation was planted _____, Sea wall ____ (height _____), Rip rap ____ (height _____),
Other bluff protection _____, Jetties _____ (length _____),
Breakwater _____ (length _____)
or other _____.

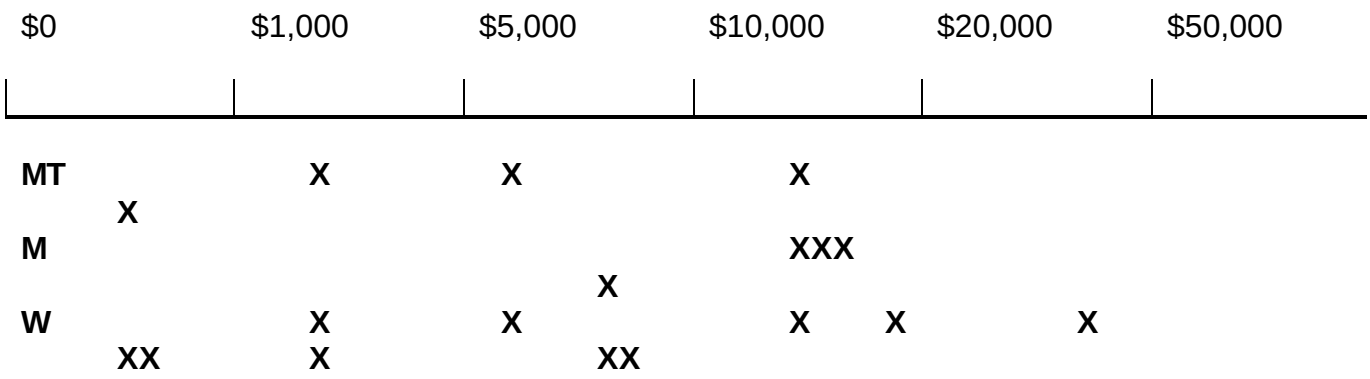
Has there been any serious erosion of your property? ____ No ____ Yes (How much, when? _____

Has there been any serious flooding of your property? ____ No ____ Yes (How much, when? _____

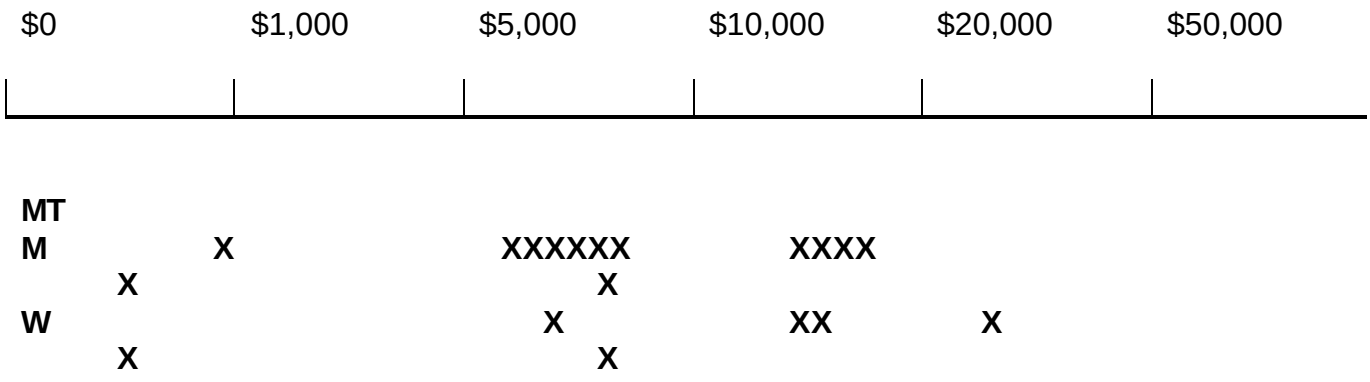
Your name (responses will be kept confidential)_____

On the range of responses below, please mark a point on the line that best represents your answer.

At what damage level would you act?



At what damage level would others, your clients or constituents act?



Your name (responses will be kept confidential)_____

On the range of responses below, please mark a point on the line that best represents your answer.

At what point would you act?

	Upon learning of potential damage	1-5 years before expected damage	When damage is imminent	1-2 years after damage occurs	3-5 years damage oc
MT	**X**	**X**	**XX**		
M	**XX**	**X**	**X**	**X**	
W	**XX**	**XX**	**XXXX**	**XX**	

At what point would others, your clients or constituents act?

	Upon learning of potential damage	1-5 years before expected damage	When damage is imminent	1-2 years after damage occurs	3-5 years damage oc
MT			**XX**		
M	**XXXX**	**X**	**XXXXX**	**XXX**	
W		**X**	**X**	**XX XXX**	

Your name (responses will be kept confidential)_____

On the range of responses below, please mark a point on the line that best represents your answer.

How much would you commit to spend on fixing a hazard problem?

Nothing — 50% of the value of the property

MT		**X**	**XXX**								
M	**X**		**X**			**X**					
W	**X**	**X**		**X**				**XX**			
			X			**X**					

How much would others, your clients or constituents commit to spend on fixing a hazard problem?

Nothing — 50% of the value of the property

MT											
M	**X**		**XXXXX**			**XX**		**XX**		**X**	
						X					
W	**XX**					**XXXX**					
						X					

Your name (responses will be kept confidential)_____

On the range of responses below, please mark a point on the line that best represents your answer.

What action would you most likely take to deal with a hazard problem?

MT = 3, M = 2, W = 7, **T = 12** Install shoreline protection
MT = 2, M = 1, W = 4, **T = 7** Move structures
MT = 1, M = 4, W = 3, **T = 8** Lobby for regulatory change or government action
MT = 1, M = 0, W = 1, **T = 2** Sell property
_____ Other
_____ Other

What action would others, your clients or constituents most likely take to deal with a hazard problem?

MT = 2, M = 8, W = 6, **T = 16** Install shoreline protection
MT = 1, M = 4, W = 1, **T = 6** Move structures
MT = 1, M = 9, W = 0, **T = 10** Lobby for regulatory change or government action
MT = 0, M = 2, W = 1, **T = 3** Sell property
M = 1 -- "Buy Property", W = 1 -- "Increase township regulation." **T = 2**. Other
_____ Other

THANK YOU FOR YOUR PARTICIPATION!

Planning & Zoning Center, Inc., 715 N. Cedar Street, Lansing, MI 48906-5206
(517) 886-0555 fax (517) 886-0564

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